NORTH ATLANTIC TREATY ORGANIZATION
ORGANISATION DU TRAITE DE L'ATLANTIQUE NORD

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See MAS Distribution List N° 2

STANAG 4337 PPS (EDITION 1) - SURFACE LAUNCHED MUNITION APPRAISAL, SAFETY AND ENVIRONMENTAL TESTS

Reference:
AC/310-D/119 dated 14 February 1994 (Edition 1) (1st Draft)

1. The enclosed NATO Standardization Agreement which has been ratified by nations as reflected in page iii is promulgated herewith.

2. Reference listed above is to be destroyed in accordance with local document destruction procedures.

3. AAP-4 should be amended to reflect the latest status of the STANAG.

ACTION BY NATIONAL STAFFS

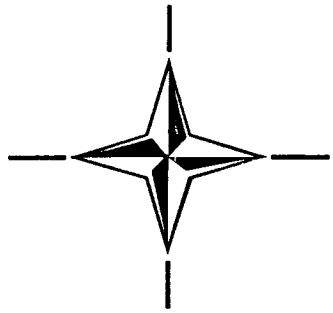
4. National staffs are requested to examine page iii of the STANAG and, if they have not already done so, advise the Defence Support Division of their intention regarding its ratification and implementation.

A. GRØNHEIM
Major General, NOAF
Chairman MAS

Enclosure:
STANAG 4337 (Edition 1)

STANAG No. 4337
(Edition 1)

NORTH ATLANTIC TREATY ORGANIZATION
(NATO)



MILITARY AGENCY FOR STANDARDIZATION
(MAS)

STANDARDIZATION AGREEMENT

(STANAG)

SUBJECT: SURFACE LAUNCHED MUNITION APPRAISAL, SAFETY AND ENVIRONMENTAL TESTS

Promulgated on 16 December 1998

K. GRØNHEIM
Major General, NOAF
Chairman, MAS

RECORD OF AMENDMENTS

No.	Reference/date of amendment	Date entered	Signature

EXPLANATORY NOTES

AGREEMENT

1. This NATO Standardization Agreement (STANAG) is promulgated by the Chairman MAS under the authority vested in him by the NATO Military Committee.

2. No departure may be made from the agreement without consultation with the tasking authority. Nations may propose changes at any time to the tasking authority where they will be processed in the same manner as the original agreement.

3. Ratifying nations have agreed that national orders, manuals and instructions implementing this STANAG will include a reference to the STANAG number for purposes of identification.

DEFINITIONS

4. Ratification is "In NATO Standardization, the fulfilment by which a member nation formally accepts, with or without reservation, the content of a Standardization Agreement" (AAP-6).

5. Implementation is "In NATO Standardization, the fulfilment by a member nation of its obligations as specified in a Standardization Agreement" (AAP-6).

6. Reservation is "In NATO Standardization, the stated qualification by a member nation that describes the part of a Standardization Agreement that it will not implement or will implement only with limitations" (AAP-6).

RATIFICATION, IMPLEMENTATION AND RESERVATIONS

7. Page iii gives the details of ratification and implementation of this agreement. If no details are shown it signifies that the nation has not yet notified the tasking authority of its intentions. Page iv (and subsequent) gives details of reservations and proprietary rights that have been stated.

FEEDBACK

8. Any comments concerning this publication should be directed to NATO/MAS - Bvd Leopold III - 1110 Brussels - BE

RATIFICATION AND IMPLEMENTATION DETAILS
STADE DE RATIFICATION ET DE MISE EN APPLICATION

NATION / PAYS	NATIONAL RATIFICATION REFERENCE REFERENCE DE LA RATIFICATION NATIONALE	NATIONAL IMPLEMENTING DOCUMENT DOCUMENT NATIONAL DE MISE EN APPLICATION	IMPLEMENTATION / MISE EN APPLICATION					
			INTENDED DATE OF IMPLEMENTATION DATE ENVISAGEE DE MISE EN APPLICATION			DATE IMPLEMENTATION WAS ACHIEVED DATE EFFECTIVE DE MISE EN APPLICATION		
			NAVY MER	ARMY TERRE	AIR	NAVY MER	ARMY TERRE	AIR
BE	GSA 34/4288 of/du 20.10.94					N.I.	N.I.	
CA								
DA								
FR								
GE	NOT RATIFYING NE RATIFIE PAS							
GR								
IT								
LU	BO 2490/94 of/du 17.05.94						N.I.	
NL*	M 94022003 of/du 15.09.94					1.11.98	1.11.98	
NO	MAS-393/94/HST/U-3/BØ/ DESH/STANAG 4337 of/du 02.06.94	STANAG 4337				1.1.95	N.I.	N.I.
PO	RRN 144/96/DA of/du 13.09.96	STANAG 4337				1.11.98	1.11.98	1.11.98
SP								
TU	G.N.P.P.: 2307-407-94/AND.D. (MAS.S./4337) of/du 18.04.94			1.12.97				
UK	D/DSTAN/341/8/4337 of/du 29.11.94	STANAG 4337				1.11.98	1.11.98	1.11.98
US*	OUSD(A&t) TWP/OM of/du 05.01.96	MIL-STD-2105b MIL-STD-331 MIL-STD-1385 MIL-STD-882				1.1.94	1.1.94	1.1.94

* See overleaf reservations/Voir réserves au verso
\+ See comments overleaf/Voir commentaires au verso

RESERVES/RESERVATIONS

NETHERLANDS	
RNAF	Not applicable
NORWAY	A requirement/test will be met/performed only if a safety analysis or nanufacture to target analysis shows that it leads to increased safety.
UNITED STATED	
Navy USMC	This STANAG is applicable to future equipment developed and not all future equipment procured.
U.S. Navy	The U.S. NAVY requires data relative to Insensitive Munitions (IM) criteria in accordance with MIL-STD-2105B and the STANAG 4439.

PAYS-BAS	
Force aérienne	N'est pas d'application.
NORVEGE	Une exigence/un essai sera remplie/sera fait seulement si une analyse de sécurité ou une analyse depuis la fabrication jusqu'à la cible ou l'élimination (MTDS) montre que cela conduit à une sécurité accrue.
ETATS-UNIS	
Marine Corps des marines	Ce STANAG est d'application au matériel développé dans le future mais pas à tous les matériels achetés.
Marine	La marine des Etats-Unis requiert des données relatives aux critères MURAT en accord avec le MIL-STD-2105B et le STANAG 4439.

NATO STANDARDIZATION AGREEMENT
(STANAG)

SURFACE LAUNCHED MUNITION APPRAISAL, SAFETY AND ENVIRONMENTAL TESTS

ANNEXES

A. Basic Safety Tests.
B. Supplementary Safety and Environmental Tests.
C. Associated National Documents.

RELATED DOCUMENTS

AECP-1	Mechanical Environmental Conditions to which materiel intended for Use by NATO Forces could be exposed.
AECTP-300	Climatic Environmental Tests
AECTP-400	Mechanical Environmental Tests
AEP-4	Nuclear Survivability Criteria for Armed Forces Material and Installations.
AOP-7	Manual of Tests for the Qualification of Explosive Materials for Military use.
AOP-15	Guidance on the Assessment of Safety and Suitability for Service of Munitions for NATO Armed Forces.
STANAG 2895	Extreme Climatic Conditions and Derived Conditions for Use in Defining Design/Test Criteria for NATO Forces' Materiel.
STANAG 4137	Standard Underwater Explosion Test for Operational Surface Ships and Crafts.
STANAG 4145	Standard Survivability Criteria for Armed Forces Material and Installations.
STANAG 4150	Shock Testing of Heavyweight Surface Ship Equipment in Floating Shock Vehicles.
STANAG 4157	Development of Safety Test Methods and Procedures for Fuzes for Unguided Tube Launched Projectiles.
STANAG 4170	Principles and Methodology for the Qualification of Explosive Materials for Military Use.
STANAG 4187	Fuzing Systems - Safety Design Requirements.
STANAG 4234	Electromagnetic Radiation (Radio Frequency) 200kHz to 40GHz environment – Affecting the Design of Materiel for Use by NATO Forces.
STANAG 4235	Electrostatic Environmental Conditions Affecting the Design of Materiel for Use by NATO Forces.

STANAG 4236	Lightning, Environmental Conditions Affecting the Design of Materiel for Use, by NATO Forces.
STANAG 4239	Electrostatic Discharge, Munitions Test Procedure.
STANAG 4240	Liquid Fuel Fire Tests for Munitions.
STANAG 4241	Bullet Attack Test for Munitions.
STANAG 4324	Electromagnetic, Radiation (Radio Frequency) Test Information to determine the Safety and Suitability for Service of Electro Explosive Devices and Associated Electronic Systems in Munitions and Weapon Systems.
STANAG 4327	Lightning, Munition Assessment and Test Procedures.
STANAG 4370	Environmental Testing
STANAG 4375	Safety Drop, Munition Test Procedures
STANAG 4382	Slow Heating Tests for Munitions
STANAG 4396	Sympathetic Reaction, Munition Tests Procedures (Draft)
STANAG 4416	Nuclear Electromagnetic Pulse Testing of Munitions Containing Electro-explosive Devices (Draft)

AIM

1. The aim of this agreement is to standardize the safety and environmental testing applied to surface-launched munitions (SLM) to support the appraisal of their safety and suitability for service in accordance with STANAG 4297 and AOP-15.

AGREEMENT

2. Participating nations agree to accept the results of safety and environmental testing of SLM performed in accordance with this document as provided by the developing nation.

DEFINITION

3. For the purpose of this document, SLM are defined as any munitions containing explosives for use by NATO forces, which are launched from the ground or sea surface, excluding nuclear weapons.

GENERAL

4. The purpose of environmental and safety testing in accordance with this document is to provide evidence for the overall assessment of the SLM system and its logistic and tactical containers to determine whether:

   a. The SLM will remain safe and suitable for service throughout their service life, in the defined Manufacture-to-Target Sequence (MTS).

b. The risk of an explosive event occurring during an accident or an otherwise survivable enemy action, or during the processes of disposal following such an accident or enemy action, is acceptably low.

5. The SLM should remain safe and suitable for service within acceptable performance limits after being exposed to severe handling and accelerated climatic conditions comparable with those which may be found during transport, storage and the operational launch environment.

DETAILS OF THE AGREEMENT

6. Procedures

a. Environmental and safety assessment (hereinafter termed the assessment) of SLM by the ratifying nations for their own Services' use should be conducted, as defined in AOP-15, from the design characteristics, safety analyses and trials reports of the nation responsible for the development of the SLM being evaluated. The safety tests at Annex A, together with the tests applicable to the SLM under appraisal at Annex B, derived using the methodology and procedures of AOP-15 and STANAG 4370 and its associated Allied Environmental Conditions and Test Publications (AECTPs) shall form the basis of the assessment and are mandatory. The nations carrying out the environmental and safety evaluation tests on particular SLM agree to make their test parameters, safety analyses and trials reports available to other NATO nations on request.

b. Notwithstanding the intention to avoid duplication of testing, each nation reserves the right to carry out additional testing.

c. Any departure from the agreed procedures shall be documented and provided by the developing nation to the ratifying nations.

d. There are some inherently different environmental hazards and operational philosophies between different types of SLM. A specific test programme includes, as mandatory, all of the tests at Annex A and those identified by the developing nation as applicable at Annex B. It may also include other tests not covered in this document but which are identified as appropriate to the appraisal of the SLM.

e. The selection of test parameters, where these have not been standardized, shall be based on the measured or analytically forecast life cycle environmental profile of the items which are being tested.

f. No individual test or group of tests can be appraised in isolation and it is agreed that the final assessment recommendation takes account of development trials, as well as individual national evaluation procedures, in order to make a valid judgement of the SLM in their expected service life environment.

7. Qualification of Explosives. The explosives used in the SLM shall be qualified in accordance with AOP-7 and, if more severe, national requirements.

8. Safety Testing of Fuzing Systems. The design safety principles of fuzes for SLM systems shall be in accordance with STANAG 4187. The testing of those fuzes shall be in accordance with STANAG 4157.

9. Environments. Environments which are to be used for the appraisal and testing of SLM shall be identified using the questionnaire at Annex A to AOP-15 and applied using the guidance given in STANAG 4370.

10. Life Cycle. Further information on the profiles of life cycles is given in AOP-15 and STANAG 4370.

11. Environmental Data Sources. Environmental data are given in STANAG 2895, AECP-1 (STANAG 2914), STANAGs 4234, 4235 and 4236.

12. Outline of an Environmental and Safety Test Programme. An environmental and safety test programme shall be developed for the SLM, based on the safety and environmental requirements contained in Paragraphs 5, 8 and 9 above, to satisfy the national/service safety evaluation organisations. This mandatory range of test procedures shall include both basic safety tests and the appropriate supplementary tests in Annex B. The construction of the test programme shall include the sequencing of tests and the number of test items required for such a programme. The selection of tests from Annex B, test methods, test procedures, test parameters and test durations, and the arrangement of test sequences shall be derived from the MTS; the logic of these choices related to the specified environments shall be documented.

13. Basic and Supplementary Safety Tests. The basic safety tests are mandatory and shall be conducted in accordance with the appropriate reference documents. These tests are given at Annex A. The basic safety tests, by themselves, are not sufficient to assess the safety of SLM. Annex B contains additional tests that, if identified in Paragraph 6 above as representing environments in the MTS, and therefore included in the test programme, become mandatory.

14. Test Pass Criteria. The test pass criteria for the safety tests are defined in the appropriate reference documents or as detailed at Annex A. On completion of an appropriate environmental test or test sequence, the SLM shall remain safe and, dependent upon the requirement of the test, be capable of functioning in the specified operational environment.

15. Test Procedures. The tests described in Annexes A and B shall be conducted in accordance with recognised procedures. STANAGs or their implementing documents shall be used in preference to national procedures.

16. Choice of Tests and Sequencing. Some or all of the environmental and safety test programme should be conducted sequentially on the SLM provided for test. Since such sequences will normally end with destructive functioning, destructive safety tests or destructive detailed examination, the detailed design of the SLM shall be critically examined so that the chosen sequence or sequences represent the best compromise between a realistic MTS of environments and those sequences which will cumulatively produce the worst degradation of the items under test. The effects of interaction of simultaneous or subsequent environmental stresses shall also be taken into account (for example, the effects of previous high temperature soak on shock sensitivity of explosives). The content of test sequences and the number of test items involved will be influenced by the similarities with previous designs, or conversely, by the technical innovation of the design and the confidence level required. The content and extent of a test programme for the SLM will be further influenced by the confidence gained from component or assembly test programmes in relation to the overall design of the munitions.

17. Additional Tests. Any tests not included in Annex B, which are considered necessary by a national authority, should be conducted to the satisfaction of that authority. Further confidence in the safety and suitability for service of all munitions will be gained by in-service surveillance.

18. Test Item Build Standard. Tests on SLM shall be classified as either development or environmental/safety tests. The spectrum of tests outlined in Annex A and those applicable from Annex B shall be included in both development and environmental/safety test programmes but development programmes may include other tests. In principle, test items representative of the production standard are required to pass the safety and environmental/safety test programme. However, if no significant changes have been made between development and production which might affect the outcome of safety tests, the national/service safety evaluation organisations may elect not to repeat some of the tests.

19. Development and Environmental/Safety Test Reporting. Nations developing the SLM system shall compile a data package which documents the test methods and programme selection rationale used for the safety and suitability for service assessment of the SLM. This data package should include detailed results obtained during development and environmental /safety tests together with any analysis or assessments. This data package shall also be supplemented by a technical design data package which should include the test item build standard used for particular tests.

20. Testing of Explosive Assemblies and Sub-Assemblies. During the MTS for SLM, the explosive assemblies and/or sub-assemblies, either packaged or unpackaged, may be subject to storage, handling, testing and transport by road, rail, sea or air. Environmental and safety testing of explosive sub-systems and/or assemblies can provide enough confidence to enable economies to be made in the testing of SLM in accordance with this STANAG, particularly when the tests from Annex A and those appropriate from Annex B are used. The overall safety and suitability for service appraisal of SLM will take account of such testing.

IMPLEMENTATION OF THE AGREEMENT

21. This STANAG is considered implemented by a nation when that nation has issued instructions that all future relevant equipment procured for its forces will be tested in accordance with the procedures detailed in this agreement.

BASIC SAFETY TESTS

INTRODUCTION

1. Safety needs to be an inbuilt feature of SLM, and as such it shall be considered when designing the SLM. Although only mandatory at the "build standard" level, it is recommended that the safety tests given in this Annex be also used during development to build confidence in the design. Tests can be carried out on sub-systems or assemblies but it would be necessary to ensure that safety is not degraded during final integration and production.

HAZARD ANALYSIS

2. Basic safety tests are defined in this Annex. As further safety tests may be dependent on the MTS, a hazard analysis should be conducted to determine which additional tests not included in this Annex but found in Annex B represent the likely environment for the SLM. The sequence and severity of the additional tests should be determined following the hazard analysis. All the tests in this Annex, together with those identified as appropriate from Annex B, are then mandatory.

TESTS

3. SAFETY DROP TEST.

   a. Reason for Test. To demonstrate that the munition will remain safe for handling and disposal following an accidental drop as may be experienced during logistic deployment (for instance dropped whilst being loaded into the hold of a ship). Also, if appropriate, to demonstrate that the munition will remain either safe and suitable for service or safe for disposal following an accidental drop during operational deployment.

   b. Information. The munition shall normally be dropped packaged onto an impact surface of concrete, faced with a steel plate. Prior to this test, munitions may be subjected to typical environmental tests (e.g., thermal cycling, humidity, vibration, shock) to simulate service use if assessment of the design indicates that such use may cause deterioration liable to affect adverseiy the outcome of the test. This test shall be applied to unpackaged stores if study of either the in-service logistics or the system by which the SLM are transferred from the manufacturer's facility to the service indicates that such a risk exists.

   c. Test Procedure. The test shall be conducted in accordance with STANAG 4375 when ratified. Until then, national procedures should be used for unilateral projects or mutually agreed procedures for multilateral projects.

4. LIQUID FUEL FIRE. The test to determine the reaction and time of reaction of the munition to an intense fire is defined in STANAG 4240.

5. SLOW HEATING.

   a. Reason for Test. The test is conducted to determine the reaction of the munition to slowly increasing heat.

   b Information. The temperature of the munition shall be raised gradually and the reaction noted.

c. Test Procedure. The test shall be conducted in accordance with STANAG 4382 when ratified. Until then, national procedures should be used for unilateral projects or mutually agreed procedures for multilateral projects.

6. BULLET ATTACK. The test to determine the reaction of a munition to being struck by small calibre ammunition is defined in STANAG 4241.

7. SYMPATHETIC REACTION.

a. Reason for Test. The test is conducted to determine the reaction of the munition to functioning of a similar store in close proximity to it.

b. Information. A knowledge of storage, transport and operational conditions shall be used to determine the configuration and number of munitions required to conduct the test. Other tests which may contribute information include Total Fragment Recovery Tests, Fragment Attack Tests and those tests performed to establish explosive quantity-to-distance hazard classification data.

c. Test Procedure. Tests shall be conducted in accordance with STANAG 4396 (draft) when ratified. Until then, national procedures should be used for unilateral projects or mutually agreed procedures for multilateral projects.

8. SAFE SEPARATION

a. Reason for Test. The test is conducted to demonstrate that the SLM separate safely from their launcher, whatever the type, when fired or released operationally.

b. Information. Firing or release trials to demonstrate safe separation from each weapons station and in each load configuration for each type of launcher shall form part of the programme of trials conducted to certify/approve the SLM for service use.

c. Test Procedure. Tests shall be conducted in accordance with an appropriate test STANAG when ratified. If none exists, national procedures should be used for unilateral projects or mutually agreed procedures for multilateral projects.

SUPPLEMENTARY SAFETY & ENVIRONMENTAL TESTS

INTRODUCTION

1. This Annex defines some tests which, where applicable to the munition being assessed, should be used to simulate the effects of environments that are associated with the munition MTS. Other tests not listed in either Annex A or this Annex may also be appropriate. The sequence and severity should be determined following hazard analysis. STANAG 4370 and its AECTPs are used to assess materiel, but they can also be used to assess munitions for safety and suitability for service provided the test parameters relate to the extreme severities identified for the munition storage and use. In assessing the munition at the extreme environments, some loss of performance may be acceptable provided safety is not affected.

TESTS

2. Paragraphs 3-7, 9, 24, 26 and 27 refer to methods included in AECTP-400, Mechanical Environmental Tests. Paragraphs 11-22 and 29-32 refer to AECTP-300, Climatic Environmental Tests.

3. VIBRATION - TRANSPORTATION. Tests conducted to determine the effects of vibrational stresses induced during transportation by sea, road, rail and air as defined in Methods 401 and 405.

4. VIBRATION - CARRIAGE. Tests conducted to determine the effects of vibrational stresses induced during carriage on the launch vehicle as defined in Methods 401 and 405.

5. VIBRATION - FREE FLIGHT. Tests conducted to determine the effects of the vibration environment of free flight as defined in methods 401 and 405.

6. SHOCK - NON-REPETITIVE. Tests conducted to determine the effects of non-repetitive shock loadings (rough handling) expected during transportation, handling and use as defined in Method 403.

7. SHOCK - REPETITIVE. Tests conducted to determine the effects of repetitive shock loadings expected during transportation or handling as defined in Methods 403 and 406.

8. SHOCK - UNDERWATER EXPLOSION. Tests to demonstrate that the munition, when embarked in a naval vessel, will remain safe and suitable for service or will remain safe for disposal when the vessel is subjected to the shock of underwater explosion as defined in STANAG 4137 and STANAG 4150.

9. ACCELERATION. Tests to demonstrate that the munition will remain safe, or remain safe and suitable for service, following accelerations/decelerations associated with accidents or use as defined in Method 404.

10. ELECTROMAGNETIC ENVIRONMENTS. Tests and assessments to demonstrate that the munition remains safe, or will remain safe and suitable for service, in various electromagnetic environments are defined in STANAGs 4239, 4324, 4327 and when published, STANAG 4370, AECTP-500 series.

11. HIGH TEMPERATURE CYCLING. Tests conducted to determine the effects of exposure to cycles of high temperature experienced during operation and storage as defined in Method 302.

12. LOW TEMPERATURE CYCLING. Tests conducted to determine the effects of exposure to cycles of low temperature as defined in Method 303.

13. CONSTANT HIGH TEMPERATURE. Tests conducted to determine the effects of exposure to constant high temperature as defined in Method 302.

14. CONSTANT LOW TEMPERATURE. Tests conducted to determine the effects of exposure to constant low temperature as defined in Method 303.

15. DRIVING RAIN. Tests conducted to determine the effects of exposure to driving rain as defined in Method 310.

16. CORROSION - SALT ATMOSPHERE. Tests conducted to determine the effect of exposure to a salt atmosphere as defined in Method 309.

17. CORROSION - ACID OR ALKALINE ATMOSPHERE

a. Reason for Test. Test conducted to determine the effect of, and that the munition will remain safe and suitable for service following exposure to an acid or alkaline atmosphere.

b. Information. Subject to satisfying the MTS, this test is preferably performed after mechanical and climatic (hot/cold) testing. The solutions used for the test should be representative of typical industrial atmospheres. The severity of the test is determined by the concentrations, spraying time, exposure conditioning (such as heat), the subsequent storage conditions (temperature and humidity) and duration, and the number of complete cycles.

c. Test Procedure. Tests should be conducted in accordance with an appropriate test STANAG when ratified. if none exists, national procedures should be used for unilateral projects or mutually agreed procedures for multilateral projects.

18. MOULD GROWTH. Tests conducted to determine the effects of exposure to typical mould cultures as defined in Method 308.

19. DUST AND SAND. Method 313.

a. Reason for Test. The test is conducted to demonstrate that the munition will remain safe and suitable for service following exposure to blowing dust and sand.

b. Information. Subject to satisfying the MTS, this test is preferably performed after mechanical and climatic (hot/cold) testing. The test severity is determined by the particle size and concentration, the air velocity and the test duration.

c. Test Procedure. Tests should be conducted in accordance with an appropriate test Method of AECTP-300 when ratified. Until then, national procedures should be used for unilateral projects or mutually agreed procedures for multilateral projects.

20. CONTAMINATION BY FLUIDS. Method 314.

a. Reason for Test. The test is conducted to demonstrate that the munition will remain safe and suitable for service following exposure to fluids typical of those to which the munition may be exposed.

b. Information. Subject to satisfying the MTS, this test is preferably performed after mechanical and climatic (hot/cold) testing. The range of fluids which should be considered include appropriate fuels, oils, hydraulic fluids, solvents, cleaning fluids, battery electrolytes and nuclear fall-out decontamination fluids. The severity of the effects of contamination is related to the temperature and duration of storage after application of the fluid(s). The fluids to be used and the severity parameters should be determined from a study of the MTS for the store. Consideration should also be given to the need to pre-heat the fluid(s) to appropriate temperatures.

c. Test Procedure. Tests should be conducted in accordance with an appropriate test Method of AECTP-300 when ratified. Until then, national procedures should be used for unilateral projects or mutually agreed procedures for multilateral projects.

21. RAPID DECOMPRESSION AND LOW PRESSURE. Method 312.

a. Reason for Test. The test is conducted to demonstrate that the munition will remain safe, or remain safe and suitable for service, following exposure to rapid pressure reduction and/or to low pressure.

b. Information. The test is concerned with the rapid fall in air pressure associated with loss of pressurisation in transport aircraft, air transport in unpressurised aircraft or air carriage at high altitudes. Therefore, study of the in-service logistics of the store will determine whether or not the store should be packaged for this test. Subject to satisfying the MTS, this test is preferably performed after mechanical and climatic (hot/cold) testing. Consideration should be given to the need for the test to be conducted at low temperatures and with high humidity during which icing will occur.

c. Test Procedure. Tests should be conducted in accordance with Method 312 of AECTP-300 when ratified. Until then, national procedures should be used for unilateral projects or mutually agreed procedures for multilateral projects.

22. THERMAL SHOCK. Tests conducted to determine the effect of exposure to large and rapid increasing or decreasing temperature changes as defined in Method 304.

23. NUCLEAR HARDENING. Tests or assessments to demonstrate that the munition will remain safe, or remain safe and suitable for service, following exposure to the effects of a nuclear explosion as defined in STANAG 4145, AEP-4 (Nuclear Surviability) and STANAG 4416 (draft).

24. LARGE ASSEMBLY TRANSPORT IMPACT. Method 408.

a. Reason for Test. The test is conducted to demonstrate that the munition will remain safe and suitable for service following impacts likely to arise during large assembly transport or handling, such as road or rail impacts.

b. Information. For this test, the munition should be packaged since it represents a simulation of impacts during transport or handling which may damage the packaging but from which the SLM should be protected. Subject to satisfying the MTS, this test may have to be performed after vibration, shock and climatic (hot/cold) testing.

c. Test Procedure. Tests should be conducted in accordance with Method 408 of AECTP-400 when ratified. Until then, national procedures should be used for unilateral projects or mutually agreed procedures for multilateral projects.

25. FREE FALL.

a. Reason for Test. The test is conducted to demonstrate that the munition will remain safe, or remain safe and suitable for service, following free fall drops that might be experienced in service.

b. Information. A study of the MTS for the munition should determine the heights from which tests should be conducted, whether or not the munition should be packaged for each height selected, and whether the munition should be required to remain safe for disposal or remain safe and suitable for service following each drop. (See also Basic Safety Test Ser No 1). The selected criteria for a particular free fall test on particular SLM will determine whether or not it should be the end-point test of a sequence but, generally, free fall tests should be preceded by vibration, shock and climatic (hot/cold) testing.

c. Test Procedure. Tests should be conducted in accordance with STANAG 4375 when ratified. Until then, national procedures should be used for unilateral projects or mutually agreed procedures for multilateral projects.

26. LIFTING. Method 409.

a. Reason for Test. The test is conducted to demonstrate that the packaged munition packaging will remain safe and suitable for service following lifting operations associated with handling and transportation.

b. Information. A study of the proposed packaging design and the in-service logistics of the munition should determine the types of lifting operation to be simulated. Since the test is essentially concerned with the adequacy of the packaging, inert munitions may be used.

c. Test Procedure. Tests should be conducted in accordance with Method 409 of AECTP-400 when ratified. Until then, national procedures should be used for unilateral projects or mutually agreed procedures for multilateral projects.

27. STACKING.

a. Reason for Test. The test is conducted to demonstrate that the munition packaging will remain safe and suitable for service following stacking operations and storage.

b. Information. The test examines the capability of the package to protect the munition during stacking and when stacked in accordance with the requirements of the in-service logistics for the munition. Since the test is essentially concerned with the adequacy of the packaging, inert munitions may be used.

c. Test Procedure. Tests should be conducted in accordance with Method 410 of AECTP-400 when ratified. Until then, national procedures should be used for unilateral projects or mutually agreed procedures for multilateral projects.

28. BLAST EFFECTS.

a. Reason for Test. The test or assessment is conducted to demonstrate that the munition will remain safe and suitable for service following exposure to the blast effects from the launch of adjacent missiles or the firing of adjacent guns.

b. Information. The munition should remain safe and suitable for service when subjected to the shock and vibration loads caused by the launch or firing of adjacent missiles or guns.

c. Test Procedure. Tests should be conducted in accordance with an appropriate test STANAG when ratified. If none exists, national procedures should be used for unilateral projects or mutually agreed procedures for multilateral projects.

29. FLOODING. Test conducted to determine the effect of exposure to flooding by sea water aboard naval vessels as defined in Method 307.

30. LEAKAGE OR IMMERSION TEST. Test conducted to determine the effect of immersion in water as defined in Method 307.

31. HAIL.

a. Reason for Test. The test is conducted to demonstrate that the munition will remain safe and suitable for service following exposure to hail, during carriage or free flight.

b. Information. The forward facing surfaces of the munition are those most likely to be affected by hail impact and a study of the munition design should ascertain this. It is likely that the test can then be conducted on the components assessed to be at risk or on samples of the materials from which those components are made.

c. Test Procedure. Tests should be conducted in accordance with an appropriate test STANAG when ratified. if none exists, national procedures should be used for unilateral projects or mutually agreed procedures for multilateral projects.

32. ICING. Method 311.

a. Reason for Test. The test is conducted to demonstrate that the munition will remain safe and suitable for service during exposure to icing conditions.

b. Information. Ice can cause arming systems to malfunction and/or safe separation problems due to weight and balance. Flight control surfaces should be functional during this test.

c. Test Procedure. Tests should be conducted in accordance with an appropriate test STANAG when ratified. If none exists, national procedures should be used for unilateral projects or mutually agreed procedures for multilateral projects.

ASSOCIATED NATIONAL DOCUMENTS

BE

CA

DA

FR

GE

GR National representatives are requested to advise the UK custodian of the documents that they require to be incorporated into this Annex

IT

NL

NO

PO

SP

TU

UK

1. Def Stan 08-5, Design Requirements for Guided Weapons, Torpedoes and Air launched Munitions.

2. Def Stan 13-131, Ordnance Board Safety Guidelines for Weapons and Munitions.

US